

the endophyte, but the nucleus of the cell remains intact." The duration of the gametophyte is apparently unlimited, so long as fertilization does not take place. The young sporophyte consists at first mainly of the primary leaf and root, which are traversed by a single axial vascular strand. A stem apex is developed at an early period, although it remains relatively inconspicuous.

The *pala* does not occur in cultivation, to the writer's knowledge. It undoubtedly would grow successfully under humid fern-house conditions, as do many other Hawaiian ferns. *M. fraxinea* Smith, which ranges from west Africa to New Zealand, is cultivated in American conservatories. The Hawaiian *pala* would likewise give a magnificent tropical effect in northern greenhouses. It deserves attention.

## PLEISTOCENE PLANTS FROM TENNESSEE AND MISSISSIPPI

BY EDWARD W. BERRY

I have published, from time to time, brief accounts of Pleistocene plants from our Atlantic and Gulf states as they have passed through my hands, since the amount of material likely to be available does not warrant a more comprehensive treatment. For this reason I wish to place on record the following new occurrences.

It is to be hoped that the distribution of our floras in the era immediately preceding the present be considered by botanists dealing with the existing flora. Even in the present unsatisfactory state of our knowledge of Pleistocene plants, woefully behind that of other civilized countries, much is to be gained in insight and many pitfalls may be avoided by looking back of the present.

This note relates to small collections made by Bruce Wade in 1915 at Adamsville, McNairy County, Tennessee, from next to the highest terrace of the Tennessee River (elevation about 500 ft.), and by E. W. Shaw from the Loess just west of

Vicksburg Military Park, Warren County, Mississippi (the Bluff formation of Hilgard).

The number of species in these two collections is small and the forms are not especially noteworthy in that they do not occur outside the existing range of the forms involved. The hackberry (*Celtis mississippiensis*) is recorded for the first time from the Pleistocene; Lesquereux's old determination of the chinquapin from the banks of the Mississippi River is in a measure corroborated by finding it fossil in western Tennessee; and the range of the Pleistocene ancestor of the spanish oak is considerably extended. Following are the species recognized with brief annotations:

OSMUNDA (?) sp.

Based upon rootstocks collected by Mr. Wade at Adamsville. Similar remains, likewise referred to *Osmunda*, were described by Hollick<sup>1</sup> from the late Pleistocene (Talbot formation) of Maryland, and the foliage of *Osmunda spectabilis* Willd. occurs in the Pleistocene of Alabama.<sup>2</sup>

QUERCUS PREDIGITATA Berry.

This form, the supposed ancestral type of the existing *Quercus digitata* and *Quercus pagodaefolia*, has been recorded previously from the Pleistocene of North Carolina,<sup>3</sup> Mississippi,<sup>4</sup> and Virginia.<sup>5</sup> It is represented at Adamsville by leaves, cupules and acorns, thus considerably extending its known range.

CASTANEA PUMILA Miller.

The small chestnut or chinquapin has been recorded by Knowlton<sup>6</sup> from the Pleistocene near Morgantown, West Virginia, and by Lesquereux<sup>7</sup> from the early Pleistocene near Columbus, Kentucky. Although I have collected materials from Lesquereux's locality and adjacent outcrops<sup>8</sup> I did not meet

<sup>1</sup> Hollick, A. Md. Geol. Surv. Pleist. 217. pl. 67. f. 3. 1906.

<sup>2</sup> Berry, E. W. Am. Jour. Sci. 29: 391. 1910.

<sup>3</sup> Berry, E. W. Jour. Geol. 15: 342. 1907.

<sup>4</sup> Berry, E. W. Torreya 14: 162. 1914.

<sup>5</sup> Berry, E. W. Am. Jour. Sci. 34: 22. f. 4, 5. 1912.

<sup>6</sup> Knowlton, F. H. Am. Geol. 18: 371. 1896.

<sup>7</sup> Lesquereux, L. Am. Jour. Sci. 27: 365. 1859.

<sup>8</sup> Berry, E. W. Proc. U. S. Nat. Mus. 48: 293-303. pls. 12, 13. 1915.

with this species. Nevertheless I see no reason for doubting Lesquereux's determination beyond the fact that he queried it. The present occurrence is based upon characteristic nuts collected by Mr. Wade at Adamsville.

CELTIS MISSISSIPPIENSIS Bosc.

This species, so far as I know, has not previously been found fossil. The present occurrence is based upon beautifully preserved, reticulate surfaced stones collected from the Loess at Vicksburg, Mississippi, by E. W. Shaw at a horizon 10 feet below the surface. The related *Celtis occidentalis* Linné is represented by stones in the late Pleistocene (Talbot formation) at Tappahannock, Virginia.<sup>1</sup>

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NOTES ON LYCASTE

BY T. D. A. COCKERELL

Among the various neotropical orchids, few are more attractive than the species of *Lycaste*. Several years ago Mrs. Cockerell brought three forms from Guatemala, and we have had abundant opportunity to study their characters, as they flowered each season in the greenhouse. The plants were purchased in Guatemala City, but were brought from the surrounding country by the natives. The most interesting and beautiful is the one known in horticulture as *Lycaste Skinneri* var. *alba*. After comparing the living plants with typical *L. Skinneri*, flowering at the same time, I came to the conclusion that the so-called variety *alba* was a distinct species. It apparently occurs wild, and in spite of assertions to the contrary, it certainly has structural as well as color characters. The lateral lobes of the lower petal or lip are much larger in *Skinneri* than in *alba*; while the bract of *Skinneri* is much shorter, not reaching the middle of the upper sepal. I wrote to Mr. R. A. Rolfe concerning the matter, and he discussed the question briefly in *Orchid Review*, 1915, p. 224. He did not believe that *alba* could be a distinct species, and I

<sup>1</sup> Berry, E. W. *Am. Nat.* 43: 435. 1909.